**1.6**

**Zeros**

When given the zeros of a polynomial function a polynomial function can be formed.

Ex.

Given *x* = 7, and *x* = -2, write a polynomial function in **factored form** with these zeros.

Solution: If x = 7, then x – 7 = 0 and if x = -2, then x + 2 = 0, so the factors are (x – 7) and (x + 2) which we use in the function:

*f*(*x*) = (*x* – 7)(*x* + 2)

To write the equation in **standard form**, **expand** (multiply the factors) of the polynomial function.

Ex.

*f*(*x*) = (*x* – 7)(*x* + 2) = *x*2 – 5*x* -14

So, the standard form of the polynomial function is: *f*(*x*) = *x*2 – 5*x* -14

Practice:

Find the polynomial function with the given zeros. Write the function in both factored form and standard form.

1. *x* = -5, *x* = 2, *x* = 1
2. *x* = 2, multiplicity 2, *x* = -3

**Simplifying Radical Numbers**

Ex. Simplify

1.  2.  3. 

**Multiplying Complex Numbers**

Multiplying complex conjugate factors:

Sum of squares identity: A2 + B2 = (A + Bi) (A – Bi)

When multiplying: (*x* – *a* – *bi*)(*x* – *a* + *bi*) = *x*2 – 2*ax* + (*a*2 + *b*2)

Remember: *i*2 = -1

Ex. Simplify

1. (5*i*)(2*i*) 2. (3 – 2*i*)(-4 + *i*) 3. (*x* – 2 – *i*)(*x* – 2 + *i*)

**Factor over the complex numbers** (see pg. 24-25)

Use the quadratic formula to find the zeros, then write the zeros as factors.